JOURNAL
OF
SOUTH AFRICAN BOTANY
VOL. XXIII.

Published: 30th November. 1957.

SOME SOUTH AFRICAN APOMICTIC GRASSES

By Walter V. Brown and W. H. P. Emery

(*The Grass Research Project, Plant Research Institute, University of Texas*)

The following South African species of grasses have been found to be apomictic. These data have been extracted from a paper that is to be published elsewhere reporting results of an extensive search for apomixis in grasses. The large number of investigators in South Africa concerned with grass research, both pure and applied, suggested transmission of this information at an early date. The results indicate that apomixis is widespread in the grasses of South Africa, especially in the Paniceae and Andropogoneae, and must be considered in all taxonomic and breeding work involving them. There are, without doubt, many more species in these tribes and a few in other tribes that are apomictic either entirely or in part.

It should be emphasized that if there are *any* apomictic plants in a species, then that species is considered to be apomictic. The results reported here imply only that one or a few plants of each species reported is apomictic, nothing more. Diploid plants of any of these species, for example *Chloris gayana*, are probably sexual. Some groups, such as *Themeda triandra*, *Urochloa*, *Bothriochloa*, *Dichanthium*, are agamic complexes that will require the recognition of the diploid sexual species as the progenitors of the apomictic polyploid "species" (cf. Stebbin's G. L., 1950, p. 396, *Variation and Evolution in Plants*, Columbia Univ. Press, N.Y.). It is quite likely that *Themeda triandra* will be broken up again into a number of diploid and polyploid species. The work of Celarier and Harlan (in press) on progeny tests at the Oklahoma A. and M. College, Stillwater, Oklahoma, U.S.A., indicates that in some species of *Bothriochloa* and *Dichanthium* there is some sexual reproduction and a few diploid forms.

The species listed below have been characterized as apomictic on the basis of embryological studies of ovules. In all cases except *Fingerhuthia africana*, *Eragrostis curvula*, *E. chloromelas*, and *E. heteromera* the apomictic mechanism was apospory. In *Bothriochloa ischaemum*, *Themeda triandra*, and *Heteropogon contortus*, detailed study has conclusively demonstrated apospory. In others, single or multiple embryo sacs with 4 instead of 8 nuclei has been taken as evidence of apospory.

All presumed apomictic grass species in the tribes Andropogoneae, Paniceae, Chlorideae, and Eragrosteae reported here have 4-nucleate embryo sacs; they lack antipodals. The numerous sexual species studied in these same tribes and genera have the typical grass embryo sac consisting of two synergids, an egg, two polar nuclei, and three or more antipodal cells.

Apomictic South African Grasses.

ANDROPOGONEAE

Bothriochloa intermedia A. Camus (= *B. glabra* A. Camus).
B. radicans (Lehm.) A. Camus
B. pertusa (L.) A. Camus
Dichanthium annulatum Stapf.
D. caricosum A. Camus
Heteropogon contortus (L.) Beauv.
Hyparrhenia hirta (L). Stapf.
H. rufa (Nees) Stapf.
Themeda triandra Forsk.

PANICEAE

Anthephora pubescens Nees.
Brachiaria brizantha (Hochst.) Stapf.
B. serrata (Spreng.) Stapf.
Panicum deustum Thunb.
P. maximum Jacq.
Pennisetum purpureum Schumach.
Tricholaena monachne (Trin.) Stapf. et Hubb.
Urochloa bolbodes (Steud.) Stapf.
U. mosambicenis (Hack.) Dandy
U. pullulans Stapf.
U. trichopus (Hochst.) Stapf.

CHLORIDEAE

Chloris gayana Kunth. (tetraploid only)
Fingerhuthia africana Lehm. (diplospory perhaps)

ERAGROSTEAE

Eragrostis curvula (Schrad.) Nees. (Diplospory probably)
E. chloromelas Steud. (Diplospory probably)
E. heteromera Stapf. (Diplospory probably)

The Grass Research Project, The Plant Research Institute
The University of Texas
Austin 12, Texas